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SURVEY OF SALARIES FOR CIVIL ENGINEERING POSITIONS

by the Committee on Salaries of the
Department of Conditions of Practice

{Discussion open until December 1, 1955}

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by The Committee on Salaries of the Department of Conditions of Practice

INTRODUCTION

This 1955 report of the ASCE Committee on Salaries is another in a biennial series. Data for the report were assembled through questionnaires similar in nature to those used for the 1953 survey, except that three preprofessional classifications, designated as A, B, and C, have been included in addition to the nine professional grades. Questionnaires were mailed in January 1955 and returns received prior to April 1 form the basis for the report.

A feature not previously included has been added to this report. In order to determine regional differentials, median rates for entrance and maximum salaries in each grade are given for five types of organizations in accordance with returns from six regional sub-divisions of the United States. Federal salaries are not included in the breakdown, inasmuch as they are subject to Civil Service standards throughout the country. Neither is a group including railroads, utilities, and industries included.

It also has been felt appropriate to attempt a comparison of the salaries of engineer employees with the income of certain classifications of labor in the construction industry. A portion of the report is devoted to that subject.

Attention is directed to two items of interest. The first is that there has been a continuing increase in salaries for all the professional grades. The second is evidence of proportionately greater increases in compensation for those in the higher positions, as compared with entrance salaries for Grade I, than was demonstrated in the 1953 report.

Salary data requested for this report deal only with payroll rates. No regard is paid to any perquisites, nor is there any adjustment to bring reported data into relationship with a standard number of hours per work week.

The only adjustment is in the case of those educational institutions where the required terms of service per year are less than the full twelve months. In such cases, reported annual salaries have been adjusted upward to the twelve-month proportional equivalent of the salary for the shorter period. This is considered to be justifiable on the assumption that a teacher will be able to augment his income during vacation time at a rate commensurate with his salary during his required teaching period. A large majority of the educational institutions reported base salaries for periods ranging from nine to eleven months per year.

ORGANIZATIONS SAMPLED

As in previous years, the survey was conducted on a sampling basis. A simple questionnaire was sent to 1,087 representative employers of engineers in the fields of consulting engineering, construction, railroads, industry, public service, and engineering education. The figures presented are based on 401 returns which were usable for some or all of the grades. The

respondents include a wide spread in numbers of engineers employed, and the resulting figures are believed to be representative of conditions existing during January, February and March, 1955.

The sources of data supplied herewith are as follows:

<u>Data Furnished</u>		
	<u>No. of Organizations</u>	<u>No. of Engineering Employees</u>
Consulting Firms	103	7,070
Construction Firms	34	1,576
Railroads, Utilities and Industries	29	4,184
Total - private organizations	166	12,830
State Highway Departments	38	35,785
Other governmental agencies	84	4,045
Total - public organizations	122	39,830
Educational institutions	113	4,526
Grand Total	401	57,186

The returns include a larger number, both of organizations and of employees, than those on which previous reports were based. In 1953, the analysis was based on 171 private organizations which covered 11,913 employees and 54 public organizations which covered 22,184 employees. The 1953 grand totals were 339 organizations and 42,922 employees.

This report has been prepared from data on civil engineering positions furnished by engineering organizations widely distributed over the continental United States, representative of the principal types of organizations that employ civil engineers, and large enough to have positions that can be allocated to a considerable number of the grade levels in the ASCE classification plan reproduced herewith.

Unless an organization may have adopted the ASCE grades for classifying its employees, a respondent is faced with the responsibility of deciding, as best he can, the brackets into which his employees should be assigned. This may not be an easy task and judgment will vary.

As was the case with previous surveys, the Committee is of the opinion that some of the maximum and minimum entrance rates shown in the columns headed "total range" in the tables apply to positions which were not properly classified by the respondents to the questionnaire. Except for these extreme values, however, a study of the reports indicates that the allocations to grade appear to have been consistently and satisfactorily performed, and it is believed that the medians and middle 50 percent ranges are reliable as of the dates shown.

Complete accuracy cannot be claimed in drawing comparisons between the results of the 1953 and 1955 surveys. That would be possible only if returns from the same organizations were used in both instances. As a matter of fact, some who reported in 1953 are not represented currently and, on the other hand, a large number of organizations are included in this survey which did not appear previously. Nevertheless, there is such consistency in the returns that direct comparisons appear to be warranted.

DATA

For convenience of comparison, both the text and tabulations in the remainder of this report are arranged in the same general form as in that of 1953. Much of the text is identical.

Tables I, II, III, IV, V, VI and VII are arranged in the same general form as that previously used. In determining median values, the rates reported by organizations are used as a basis, without regard to the number of engineers in the employ of the organizations.

It will be noted that only a small number of Federal employees are included in the report on which Table VI is based. In view of the fact that Federal schedules are established on a nation-wide basis, it would have been reasonable merely to have quoted the standard U. S. Civil Service rates without depending upon any questionnaires and to have related them to the very large number of employees in the various grades. However, it was decided that it would be appropriate to solicit direct responses and questionnaires were sent to a few widely separated offices under jurisdiction of the Bureau of Reclamation, the Corps of Engineers and the Atomic Energy Commission. As was expected, returns were almost completely uniform in character. Only the employees in the offices which reported are noted herein.

In this connection, it is to be noted that not all Federal employees are compensated in strict conformance with Civil Service rates. The Tennessee Valley Authority affords an example. Although salaries for TVA employees follow the Civil Service general pattern, actual rates are determined by the Authority. Inclusion of those rates would have changed, somewhat, the figures carried herein. It was concluded that, for the purpose of this report it would be preferable to show only the Civil Service standards.

Tables VIII to XX, inclusive, carry comparisons of median entrance rates and median maximum rates for each of the grades as reported from six subdivisions of the country. The sub-divisions are indicated in Figure 1. Comparisons are shown for the following types of organizations: Consulting Firms, Construction Firms, State Highway Departments, Municipalities and Counties, and Educational Institutions.

In all cases, values have been rounded to the nearest ten dollars rather than to carry them out to the last digit.

The 1953 report recorded the trend in entrance median salaries for the lowest professional grade (ASCE Grade I) from 1939 to date. The same data are reproduced in Figure 2 with the corresponding figure for 1955 added. Although the trend still is upward, it is found that the rate of increase has flattened. For the most recent two years, the median increased at a rate of about \$115 per year as compared with \$330 for the period 1951-1953.

The 1953 report also showed the percentages of increase in median entrance salary for each of the professional grades during the preceding two years. During that period there had been a 20 percent increase in entrance salaries for Grade I. Moving into the higher grades, the percentages dropped rapidly until, at Grade VI, there had been no increase. This reflected conditions that have been a source of great dissatisfaction among engineer employees.

Analysis of returns for the 1955 survey presents a marked change in the situation. The statistics indicate that increases since 1953 have averaged 8.2 percent for the entire range of professional grades, with extreme limits of 6.5 percent and 11.1 percent. This is accepted as gratifying evidence that men with long experience are receiving better recognition than was the case in previous years. The results are shown graphically on Figure 3.

REGIONAL RELATIONSHIPS

The Committee wished to develop regional relationships based upon the salary rates reported from the six regions of the country indicated on Figure 1. Therefore, it was determined to derive averages for all nine professional grades in each region, based on returns from Consulting Firms, State Highway Departments and the group of Municipalities and Counties. These groups are represented in Tables XI to XIX. Although returns from construction firms also are included in the tables, they are omitted from this calculation because of the lack of data in a number of the grades.

The first step in computation consisted of obtaining an average for each grade of all the median rates, including both entrance and maximum values, for each region in each of the tables. Working with these average figures, an average of all the grades, I to IX inclusive, was obtained for each region. Comparison of the values so obtained showed the following relationships, using Region I as a base:

Region I, New England	- - - - -	100%
" II, Middle Atlantic	- - - - -	117%
" III, Middle West	- - - - -	109%
" IV, South	- - - - -	124%
" V, West	- - - - -	107%
" VI, Far West	- - - - -	122%

While the foregoing cannot properly be accepted as an accurate evaluation, it is felt that the results give a good approximation of the differentials existing among the six regions.

ASCE CLASSIFICATION OF CIVIL ENGINEERING POSITIONS

When it is desired to ascertain the relative levels of professional civil engineering positions, they should be classified according to the relative importance of duties to be performed and responsibilities incident thereto. In this report, as in previous ones, a general specification has been established for each classification. These specifications describe the duties and requirements usually associated with the classifications and the qualifications expected of the persons who perform the work and discharge the specified responsibilities.

Preprofessional Grades

Following are the descriptive "Classifications for Preprofessional Grades" in the form submitted with the questionnaire:

Grade A positions are to include employees who are able, under supervision, with little or no previous experience, to assist with simple routine engineering work in field or office.

Typical tasks are to serve in the field as chainman or flagman, in the office, to index and file plans and survey books, to copy engineering data, to make simple arithmetical calculations or to check and plot level notes.

Grade B positions are to include employees who are able, under supervision, to do the simpler types of preprofessional engineering work in office, laboratory and field, not necessarily requiring professional engineering training but requiring some experience.

Typical tasks are to serve as rodman on survey or construction work, to make simple survey or construction notes, to do simple level and transit work, to perform simple routine testing, or to do simple engineering office work including arithmetical calculations.

Grade C positions are to include employees who are able, under supervision, to do engineering work somewhat more difficult than that required in Grade B, in office, laboratory, or field, not necessarily requiring professional engineering training but requiring qualifying experience.

Typical tasks are to make graphs and charts, to perform ordinary engineering computations, to make and check survey and construction notes, to make routine construction drawings, to do level and transit work, to make routine inspections on construction work, or to make routine tests of the properties of soils or materials of construction.

The requirements for Grade C are such that there is likely to be some overlapping with respect to those for Grade I of the ASCE professional grade series. Employees at the top of this classification (Grade C) may have graduated from college or possess a reasonably equivalent combination of education and experience. Such men are considered to be in preprofessional work with the full expectation of advancing into a professional grade. Differentiation between these "preprofessional" employees and "subprofessional" employees is based on the premise that the latter do not possess qualifications that will permit them to progress up the ladder of the professional grades.

Professional Grades

The nine ASCE professional grade specifications, adopted in 1946, are based, grade for grade, on statements published by the U. S. Civil Service Commission regarding its professional grades formerly identified as "P-1" through "P-9," and since October 1949 identified (without other change) as "GS-5, 7, 9, 11, 12, 13, 14, 15, and 16." In each case the "GS" number or grade designation is shown following the comparable ASCE grade description.

It is expected that in applying this plan to organizations which do not have employees in all the nine classifications, due consideration will be given to the appropriate relationship of the various positions which exist in such organizations, and the duties and responsibilities of such positions.

Also, in large organizations where engineering training is considered desirable for the managerial staff, men with engineering training and experience will occupy positions which are not primarily engineering in character. These positions many times will carry salaries that are compensation in part for managerial functions. Such positions should not be assigned to engineering grades. The responsible engineering head of a large organization will in general be considered to be in Grade IX.

These classifications include all classes of positions, the duties of which are to perform operational, creative, advisory, administrative, or research work which is based on the established principles of the civil engineering profession. The fundamental prerequisite for every position to be classified in these grades is professional, scientific, or technical training equivalent to that represented by graduation from a college or university of recognized standing.

Grade I includes all positions, which involve, under immediate supervision, the performance of fundamental civil engineering duties requiring professional training but little or no experience. (Federal GS-5)

Grade II includes all positions which involve, under immediate or general supervision, individually or with a small number of subordinates, the performance of civil engineering duties requiring professional training, previous experience, and to a limited extent the exercise of independent judgment. (Federal GS-7)

Grade III includes all positions which involve, under general supervision, individually or with a number of subordinates, the performance of civil engineering duties of substantial difficulty and responsibility, requiring professional training, previous experience, and independent judgment. (Federal GS-9)

Grade IV includes all positions which involve, under general supervision, individually or with a number of subordinates, the performance of difficult civil engineering duties or the supervision of a subdivision of an engineering organization, requiring professional training, previous experience, recognized leadership, and independent judgment. (Federal GS-11)

Grade V includes all positions which involve, under general supervision, individually or with a number of subordinates, the performance of difficult civil engineering duties or the supervision of a division of an engineering organization, or the direction of a staff on investigative studies, research and testing, design, or construction, requiring professional training, previous experience, recognized leadership, and independent judgment. (Federal GS-12)

Grade VI includes all positions which involve, under general direction, individually or with a number of subordinates, the performance of difficult civil engineering duties or the supervision of a division of an engineering organization, or acting as the principal assistant to the head of a division of a large engineering organization or the direction of a staff on investigative studies, design or construction requiring professional training, successful experience in engineering work. (Federal GS-13)

Grade VII includes all positions which involve, under general direction, individually or with a number of subordinates, the performance of important civil engineering duties or the supervision of a division of a large engineering organization, or the direction of a staff on investigative studies, design or construction, requiring professional training, extensive successful experience in engineering work with demonstrated aptitude and capacity for increased responsibilities in managerial and executive functions. (Federal GS-14)

Grade VIII includes all positions, such as:

- a) the assistant to the technical and administrative head of an important engineering organization; or
- b) the technical and administrative head of a lesser engineering organization; or
- c) positions involving the development, analysis, and evaluation, for final executive action, of difficult and complex engineering projects with respect to their feasibility, cost, economic justification, and public necessity or convenience. (Federal GS-15)

Grade IX includes all positions, such as:

- a) the administrative and professional head of an important engineering organization with full authority and responsibility for conceiving and

- executing all the plans and functions of the organization, directing an administrative and professional engineering staff engaged in varied important projects; or
- b) positions requiring highly specialized professional engineering or scientific ability. (Federal GS-16)

The duties of faculty members in educational institutions are not such as to fit into the foregoing classifications. Therefore, as will be noted in Tables VII and XX, returns were requested on the basis of salaries for Instructor, Assistant Professor, Associate Professor, Professor and Head of Department.

FRINGE BENEFITS

For the 1951 survey, data on "fringe benefits" were obtained and were taken into account in reporting the results. Questionnaires for the 1953 and 1955 surveys requested only base salary rates without regard to any superimposed compensation in the way of bonus payments, vacations, sick leave or other perquisites.

This was done with full recognition that such added perquisites definitely form a part of the over-all compensation received by employees and that allowance should be made for them in arriving at total values. As an indication of the extent of some of the more important items, the following data from the earlier report are given. It is believed that the various figures shown are substantially in accord with current practice.

Data submitted for the 1951 report indicate that the total value of added perquisites varies between 12 percent and 18 percent of base salaries.

Hours of Work per Week:

Eighty-two percent of private firms and 53 percent of public agencies reported 40 hours as the normal work-week. Range of replies was from 35 to 50 hours. Field staffs frequently work longer hours than office staffs, the added time ranging from four to ten hours per week.

Holidays:

Seventy-four percent of private firms observe 5, 6 or 7 holidays, with 40 percent giving 6. Range is from 5 to 12. Sixty-seven percent of public agencies observe 10, 11, 12 or 13 holidays; 31 percent give 11. The range is from 6 to 15.

Annual Leave or Vacation:

Seventy-eight percent of private firms allow 10 work days for vacation (two calendar weeks). The range is 9 to 18 work days. Thirty percent of public agencies reported 10 work days for vacation; 28 percent reported 12; and 18 percent reported 15. The range is 9 to 26 work days.

Sick Leave:

Fifty percent of the private firms reported that they have no formal allowance for sick leave. Of those that have an allowance, 47 percent favor 10 work days, the range being from 5 to 20. Thirty-nine percent of public agencies allow 12 work days; 22 percent allow 15; and 16 percent allow 10. The range is from 9 to 30 work days.

There is known to be a great variety in the provisions for sick benefit plans, such as when the allowance starts (immediately, or after so many days of illness), scaled allowances according to length of service, etc.

Bonus:

Eighty percent of consulting engineers pay a bonus to their employees, from 2 percent up, the average being between 7 and 8 percent or about four-weeks' salary. The same percentage of construction firms also pay a bonus at about the same average rate as the consultants.

U. S. Social Security:

U. S. Social Security Accounts for their employees are carried universally by private organizations that employ civil engineers except railroads, whose employees are covered by the Railroad Retirement Act. The public agencies that responded included no Social Security Accounts.

Retirement Plans:

Retirement plans for employees, other than U. S. Social Security, were reported by 37 percent of the private, and 86 percent of the public organizations that reported. The contributions reported by employers ranged between 3 percent and 7 1/2 percent of salary, 5 percent and 6 percent being the most frequent.

WAGES IN CONSTRUCTION TRADES

In discussions on salary rates for engineering positions, reference frequently is made to rates of pay in construction trades. The Committee therefore secured some data on wage rates and average earnings for inclusion in this report. The basic data are from publications of the Bureau of Labor Statistics.

Table XXI is taken from Table 26 of the February 1955 issue of CONSTRUCTION REVIEW, Vol. 1, Number 2, a monthly periodical published under the joint auspices of the U. S. Departments of Labor and of Commerce, the Labor Department being represented by the Bureau of Labor Statistics.

Table XXII is based on Table 41 from the March, 1955 issue (Volume 1, Number 3) of the same periodical with the addition of columns 6 through 10 by direct computations.

It should be noted that the earnings reported by the Bureau are on a weekly basis, as income of those who were working at the particular times. Information is not furnished as to how many weeks were worked, on the average, during the year, so that the actual annual earnings are not given. In fact, direct comparison between annual earnings in engineering positions and annual earnings in the construction trades is not easy, due to differences in the conditions of employment.

The work-periods of engineers are relatively constant. Engineers usually are employed on a continuous basis, layoffs due to weather, delays in delivery of equipment or materials, and similar interruptions being rare. Many craftsmen enjoy long periods of continuous employment, but on the whole, the work periods of employees in the trades are much more sensitive to interruptions. The size of the labor force will fluctuate as portions of a project are finished, members of the special crafts being employed virtually on a task-to-task basis. A construction company may have periods between successive jobs when there is no work for the skilled trades. It is therefore difficult to decide what are average or typical annual earnings in the crafts comparable to annual earnings of engineers.

Computations of income have been made on the basis of some assumptions as to weeks worked during the year, and the results are shown in columns 6 through 10.

It is to be realized, in making comparisons, that the rates shown in Table XXI and the average earnings in Table XXII are virtual maximums, as contrasted with the usual pay plans for engineers that provide periodic raises on the basis of merit. Also, it is important to bear in mind that, as already mentioned, engineering salaries given in this report are base rates. They do not include any of the perquisites which must be added to arrive at total compensation. This means that, in general, the engineering salaries shown in this report must be increased by amounts ranging between 12 percent and 18 percent in order to arrive at figures properly comparable with the wages of craftsmen.

CONCLUSION

The Committee is grateful to all those who supplied basic data for this report. The substantial demand for copies of past reports has indicated the value of periodic appraisals of salaries throughout the country. It is hoped that this one may prove to be useful. In accordance with schedule, the next report is planned for issuance in 1957.

Respectfully submitted,

ASCE Committee on Salaries

Oscar S. Bray

Donald H. Mattern

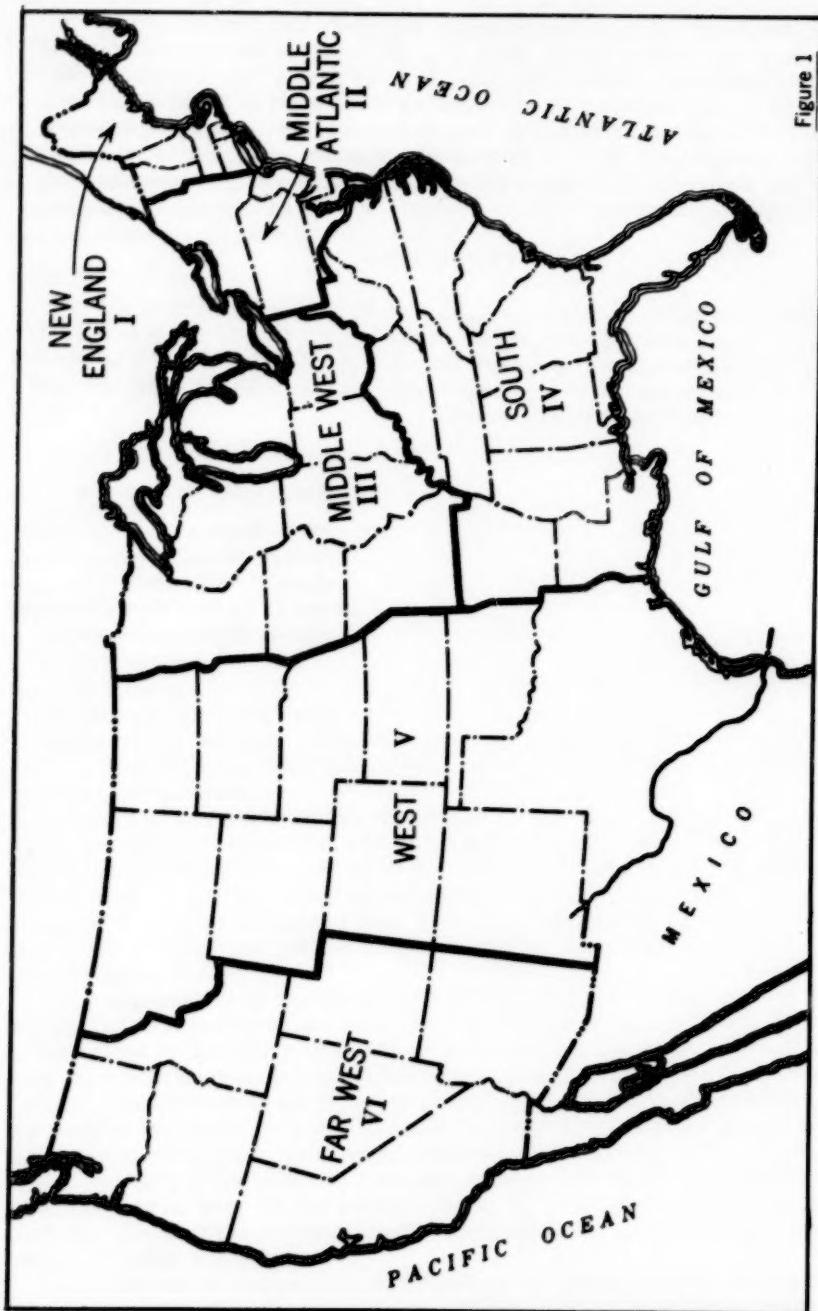
Graham P. Willoughby

Dewitt C. Greer, Vice Chairman

Robert J. Ellison, Chairman

June 17, 1955

Figure 1



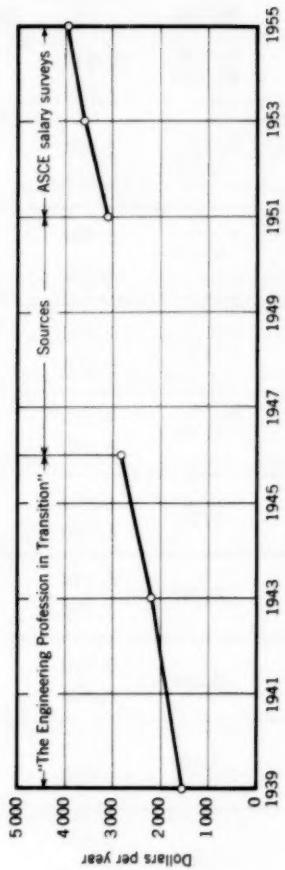


FIG. 2—ANNUAL MEDIAN BASE SALARIES FOR ENTRANCE INTO ASCE GRADE I

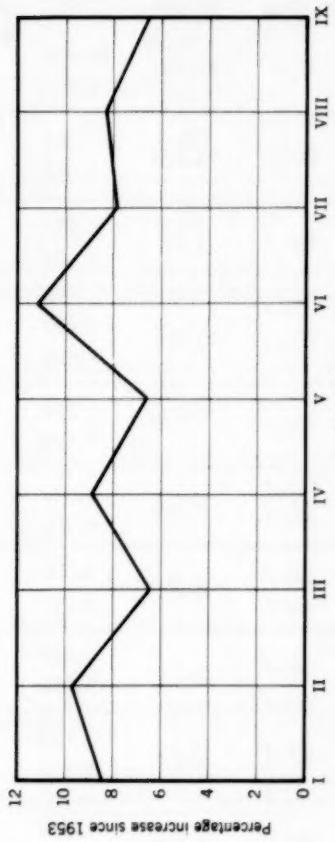


FIG. 3—BASE-SALARY INCREASES SINCE 1953

TABLE I - PRIVATE ORGANIZATIONS - CONSULTING FIRMS

Data obtained from 103 consulting firms (7,070 engineers)

Grade	Orgns Reporting	Entrance Rates			Maximum Rates		
		Median	Middle 50%	Total Range	Median	Middle 50%	Total Range
A	71	\$2,490	\$2,250 2,870	\$1,940 3,920	\$3,230	\$2,930 3,770	\$2,300 4,920
B	67	3,130	2,720 3,530	2,170 4,500	3,810	3,300 4,420	2,830 5,390
C	82	3,670	3,150 4,040	2,600 5,460	4,500	3,960 5,130	3,360 6,530
I	88	3,920	3,660 4,120	3,140 5,370	4,570	4,210 4,910	3,770 6,220
II	88	4,480	4,250 4,810	3,600 5,710	5,380	4,970 5,820	4,210 7,270
III	97	5,110	4,530 5,580	5,130 4,680	5,920	5,500 6,620	8,840 5,350
IV	80	5,810	5,500 6,050	5,300 5,070	6,800	6,370 7,240	9,230 5,960
V	76	6,500	6,020 7,160	8,670 5,480	8,140	6,790 8,620	10,880 6,800
VI	69	7,400	6,630 8,450	10,800 6,470	8,880	8,240 9,850	13,820 8,170
VII	61	8,560	7,300 9,900	12,470 6,730	10,840	9,390 12,410	15,430 8,780
VIII	51	9,170	7,940 10,650	14,630 9,230	11,850	10,150 13,910	20,400 11,380
IX	33	12,820	9,810 16,130	19,380	17,620	14,810 25,780	37,600

TABLE II - PRIVATE ORGANIZATIONS - CONSTRUCTION FIRMS

Data obtained from 34 construction firms (1,576 engineers)

Grade	Orgns Reporting	Entrance Rates			Maximum Rates		
		Median	Middle 50%	Total Range	Median	Middle 50%	Total Range
A	16	\$3,150	\$2,580	\$2,400	\$4,020	\$3,280	\$3,200
			3,570	4,010		4,510	4,830
				2,840			3,970
B	15	3,720	3,420		4,890	4,300	
			4,080	4,840		5,000	5,610
				3,910			4,620
C	20	4,430	4,100		5,380	5,090	
			4,660	5,550		5,880	6,870
				3,570			4,410
I	21	4,100	3,790		5,110	4,820	
			4,550	6,110		5,630	7,040
				3,890			4,800
II	21	4,920	4,040		5,700	4,950	
			5,190	6,300		6,030	7,370
				4,860			5,800
III	25	5,470	4,970		6,550	5,900	
			5,850	6,760		7,390	8,360
				5,270			6,650
IV	21	6,340	5,500		7,850	6,840	
			6,970	8,400		8,400	10,570
				5,940			7,130
V	26	7,240	6,430		8,520	7,300	
			7,780	9,640		9,700	11,250
				6,660			7,970
VI	18	8,000	7,260		9,480	8,940	
			8,450	9,650		9,780	12,590
				7,640			9,240
VII	18	8,740	7,780		10,990	9,700	
			9,460	11,680		11,540	13,920
				8,100			9,800
VIII	15	11,170	8,900		13,600	11,580	
			11,710	15,520		14,350	19,600
				12,400			14,400
IX	17	14,340	14,650		17,700	15,050	
			14,980	18,680		2,300	22,600

TABLE III - PRIVATE ORGANIZATIONS - RAILROADS, UTILITIES AND INDUSTRIES
 Data obtained from 29 private organizations (4,184 engineers)

Grade	Orgns Reporting	Entrance Rates			Maximum Rates		
		Median	Middle 50%	Total Range	Median	Middle 50%	Total Range
A	18	\$3,120	\$2,600 3,440	\$2,080 3,760 2,550	\$3,610	\$3,240 4,000	\$2,550 5,650 3,120
B	17	3,790	3,150 4,180	4,380 3,120	4,440	3,960 4,620	5,050 3,640
C	16	4,220	3,900 4,480	4,950 3,120	5,280	4,730 5,990	6,900 3,800
I	23	4,260	3,640 4,560	5,400 3,600	5,100	4,650 5,490	7,320 4,200
II	21	4,680	4,240 5,040	5,750 4,200	5,790	5,180 6,180	7,090 4,800
III	26	5,250	4,920 5,670	6,600 5,100	6,780	6,230 7,600	8,700 5,400
IV	25	6,260	5,800 6,500	7,800 5,340	8,310	7,020 8,570	11,160 6,600
V	22	7,140	6,500 7,880	15,600 5,700	9,030	8,400 10,420	15,590 7,600
VI	17	8,460	7,200 9,100	15,600 7,200	10,960	8,960 12,830	17,990 8,700
VII	17	9,440	7,900 11,620	18,000 8,610	12,240	10,740 15,610	29,520 11,000
VIII	12	11,250	9,000 12,500	29,520 13,200	13,570	11,500 16,620	29,520 16,000
IX	10	16,880	14,260 22,500	35,400	19,500	16,850 35,200	35,580

TABLE IV - PUBLIC ORGANIZATIONS - STATE HIGHWAY DEPARTMENTS

Data obtained from 38 state highway departments (35,785 engineers)

Grade	Orgns Reporting	Entrance Rates			Maximum Rates		
		Median	Middle 50%	Total Range	Median	Middle 50%	Total Range
A	37	\$2,320	\$2,120 2,400	\$2,040 2,910 2,340	\$3,040	\$2,650 3,210	\$2,420 3,680 2,930
B	38	2,780	2,510 2,950	3,340 2,630	3,630	3,200 3,800	4,280 3,260
C	34	3,260	3,050 3,380	3,760	4,230	3,880 4,380	4,840
I	37	3,720	3,220 3,900	2,940 4,260 3,280	4,540	4,100 4,780	3,840 5,400 4,290
II	37	4,120	3,630 4,290	4,770 4,010	5,070	4,450 5,400	6,160 5,260
III	38	4,850	4,250 5,120	5,650 4,500	6,060	5,510 6,380	7,110 5,810
IV	39	5,520	4,930 5,930	6,650 4,900	6,780	6,030 7,240	8,240 6,450
V	36	6,020	5,320 6,450	7,250 5,660	7,450	6,610 7,840	8,950 7,270
VI	35	6,990	6,130 7,350	8,410 6,650	8,610	7,720 9,160	10,220 8,400
VII	35	7,920	7,040 8,310	9,690 9,300	9,490	8,650 10,150	11,990 8,850
VIII	28	8,730	8,170 9,030	10,320 8,670	10,600	9,690 11,020	12,670 9,920
IX	31	10,390	9,290 10,980	11,860	12,250	10,330 12,870	15,140

TABLE V - PUBLIC ORGANIZATIONS - MUNICIPALITIES AND COUNTIES

Data obtained from 79 public organizations (3,857 engineers)

<u>Grade</u>	<u>Orgns Reporting</u>	<u>Entrance Rates</u>			<u>Maximum Rates</u>		
		<u>Median</u>	<u>Middle 50%</u>	<u>Total Range</u>	<u>Median</u>	<u>Middle 50%</u>	<u>Total Range</u>
A	55	\$2,790	\$2,430	\$2,070	\$3,280	\$2,900	\$2,710
			3,040	3,370		3,570	3,990
				2,550			3,080
B	61	3,150	2,800		3,650	3,300	
			3,480	4,200		4,060	4,490
				2,860			3,370
C	69	3,620	3,290		4,400	3,840	
			3,970	4,670		4,770	5,280
				3,150			3,780
I	40	4,060	3,700		4,720	4,350	
			4,220	4,420		4,920	5,330
				3,400			4,060
II	48	4,310	3,780		5,070	4,400	
			4,490	4,800		5,340	5,740
				3,780			4,400
III	40	4,760	4,270		5,640	5,020	
			4,990	5,570		6,120	6,600
				4,040			4,720
IV	52	5,280	4,440		6,160	5,180	
			5,560	6,040		6,620	7,060
				4,280			5,120
V	45	5,760	4,920		6,730	5,710	
			6,230	7,250		7,390	8,360
				4,930			5,600
VI	42	6,060	5,290		7,390	6,200	
			6,500	7,420		7,770	8,700
				5,170			6,380
VII	38	6,900	5,920		8,030	7,250	
			7,600	8,520		8,960	9,890
				5,890			6,240
VIII	43	8,010	6,250		8,690	7,520	
			8,570	10,650		10,080	12,000
				6,260			7,670
IX	42	9,290	8,000		10,980	9,570	
			10,340	13,690		12,360	15,150

TABLE VI - PUBLIC ORGANIZATIONS - FEDERAL AGENCIES *

Data obtained from 5 federal agencies (188 engineers)

Grade	Orgns Reporting	Entrance Rates			Maximum Rates		
		Median	Middle 50%	Total Range	Median	Middle 50%	Total Range
A	3	\$2,750	\$2,750 2,750	\$2,500 2,750	\$3,230	\$3,230 3,230	\$3,230 3,230
B	3	2,950	2,950 2,950	2,950 2,950	3,430	3,430 3,430	3,430 3,430
C	3	3,180	3,180 3,180	3,180 3,180	3,660	3,660 3,660	3,660 3,660
I	4	3,410	3,410 3,410	3,410 3,410	4,160	4,160 4,160	4,160 4,160
II	4	4,200	4,200 4,200	4,200 4,200	4,900	4,830 4,960	4,830 4,960
III	4	5,060	5,060 5,060	5,060 5,060	5,810	5,810 5,810	5,810 5,810
IV	4	5,940	5,940 5,940	5,940 5,940	6,940	6,940 6,940	6,940 6,940
V	5	7,040	7,040 7,040	7,040 7,040	8,040	8,040 8,040	8,040 8,040
VI	5	8,360	8,360 8,360	8,360 8,360	9,360	9,360 9,360	9,360 9,360
VII	4	9,600	9,600 9,600	9,600 9,600	10,600	10,600 10,600	10,600 10,600
VIII	4	10,800	10,800 10,800	10,800 12,000	11,800	11,800 11,800	11,800 12,800
IX	3	12,000	12,000 12,000	12,000 12,000	12,800	12,800 12,800	12,800 12,800

* Not all federal agencies conform exactly to this schedule. For instance, although salaries of Tennessee Valley Authority employees follow the general pattern they are determined by the Authority and vary from the Civil Service rates.

TABLE VII - EDUCATIONAL INSTITUTIONS *

Data obtained from 113 educational institutions (4,526 engineers)

Grade	Orgns Reporting	Entrance Rates			Maximum Rates		
		Median	Middle 50%	Total Range	Median	Middle 50%	Total Range
Instructor	103	\$4,650	\$4,180	\$3,590	\$5,770	\$5,270	\$4,610
			5,040			6,010	
				5,530			7,120
Assist. Prof.	106	5,600	5,090	4,450	7,000	6,360	5,630
			6,010			7,510	
				7,000			8,810
Assoc. Prof.	105	6,740	6,070	5,270	8,270	7,460	6,240
			7,180			9,340	
				8,550			11,700
Professor	104	7,960	7,230	5,980	10,000	8,690	6,990
			8,850			11,600	
				11,470			18,560
Head of Dept.	82	8,890	7,840	6,450	10,640	9,050	8,160
			9,970			11,970	
				13,290			17,400

* All data reported on a basis of less than 12 months of required service
 have been adjusted upward to the proportional equivalent for a full year.

TABLE VIII - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE A

<u>Region (See Fig. 1)</u>	<u>Consultants</u>		<u>Contractors</u>		<u>Highway Depts.</u>		<u>Munic. & Counties</u>	
	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>
I	\$2,100	\$2,500	\$ -	\$ -	\$2,140	\$2,670	\$2,550	\$3,070
II	2,400	3,600	2,990	4,470	2,370	3,160	2,720	3,320
III	2,080	2,600	-	-	1,980	2,580	2,400	2,700
IV	2,550	3,600	3,600	4,200	2,160	3,340	3,370	3,790
V	2,550	3,300	2,500	3,400	2,280	3,000	2,400	2,900
VI	3,300	3,770	3,500	4,000	3,000	3,500	3,320	3,940

TABLE IX - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE B

<u>Region (See Fig. 1)</u>	<u>Consultants</u>		<u>Contractors</u>		<u>Highway Depts.</u>		<u>Munic. & Counties</u>	
	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>
I	\$2,580	\$3,000	\$ -	\$ -	\$2,520	\$3,230	\$2,710	\$3,250
II	3,120	4,450	3,500	4,000	2,940	3,640	3,030	3,350
III	2,700	3,110	-	-	2,330	3,300	2,700	3,180
IV	3,600	4,200	4,000	6,000	2,780	3,940	3,820	4,280
V	3,100	3,600	3,400	4,580	2,700	3,530	3,040	3,690
VI	3,700	4,520	4,000	5,000	3,400	3,350	3,640	4,180

TABLE X - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE C

<u>Region (See Fig. 1)</u>	<u>Consultants</u>		<u>Contractors</u>		<u>Highway Depts.</u>		<u>Munic. & Counties</u>	
	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>
I	\$3,000	\$3,500	\$ -	\$ -	\$2,760	\$3,400	\$3,230	\$4,020
II	3,900	5,400	4,420	4,680	3,560	4,380	3,600	4,000
III	3,120	3,900	-	-	2,830	3,800	3,020	3,960
IV	4,400	5,100	4,100	5,460	3,300	4,900	4,300	5,030
V	3,600	4,200	4,200	5,400	3,300	4,300	3,380	4,380
VI	4,000	4,900	5,000	6,000	3,850	4,600	4,170	5,000

TABLE XI - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE I

<u>Region (See Fig. 1)</u>	<u>Consultants</u>		<u>Contractors</u>		<u>Highway Depts.</u>		<u>Munic. & Counties</u>	
	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>	<u>Entr.</u>	<u>Max.</u>
I	\$3,500	\$4,200	\$ -	\$ -	\$3,270	\$4,030	\$3,630	\$4,060
II	4,200	4,940	4,180	5,300	3,560	4,380	4,010	4,610
III	3,900	4,250	-	-	3,500	4,680	3,600	4,200
IV	4,050	4,750	4,200	5,200	4,080	4,800	4,590	5,180
V	3,700	4,500	4,160	4,680	3,840	4,620	3,960	4,680
VI	4,200	4,800	3,880	5,260	4,100	4,750	4,580	5,580

TABLE XII - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE II

<u>Region (See Fig. 1)</u>	<u>Consultants</u> <u>Entr.</u>	<u>Max.</u>	<u>Contractors</u> <u>Entr.</u>	<u>Max.</u>	<u>Highway</u> <u>Entr.</u>	<u>Depts.</u> <u>Max.</u>	<u>Munic. & Counties</u> <u>Entr.</u>	<u>Max.</u>
I	\$4,160	\$5,200	\$ -	\$ -	\$3,690	\$4,670	\$3,690	\$4,460
II	4,800	5,900	4,700	5,700	3,880	4,540	4,260	4,810
III	4,250	5,100	-	-	3,940	4,780	3,840	4,550
IV	4,600	5,400	4,680	5,000	4,560	5,710	4,980	5,680
V	4,500	5,300	4,590	5,350	4,200	5,230	4,320	5,100
VI	4,550	5,400	5,720	6,760	4,450	5,500	4,760	5,800

TABLE XIII - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE III

<u>Region (See Fig. 1)</u>	<u>Consultants</u> <u>Entr.</u>	<u>Max.</u>	<u>Contractors</u> <u>Entr.</u>	<u>Max.</u>	<u>Highway</u> <u>Entr.</u>	<u>Depts.</u> <u>Max.</u>	<u>Munic. & Counties</u> <u>Entr.</u>	<u>Max.</u>
I	\$4,800	\$5,310	\$ -	\$7,300	\$4,800	\$5,920	\$4,310	\$4,490
II	5,400	6,500	5,150	6,500	5,210	6,640	4,380	5,200
III	5,100	5,600	4,800	5,000	4,510	5,640	4,080	5,500
IV	5,100	6,000	5,450	6,300	5,090	6,600	5,950	6,780
V	5,160	6,100	5,350	6,240	4,500	5,520	4,710	5,490
VI	5,100	6,000	6,630	7,950	5,000	6,050	5,120	6,380

TABLE XIV - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE IV

Region (See Fig. 1)	Consultants		Contractors		Highway Depts.		Munic. & Counties	
	Entr.	Max.	Entr.	Max.	Entr.	Max.	Entr.	Max.
I	\$5,200	\$6,000	\$ -	\$ -	\$5,160	\$6,550	\$4,470	\$5,180
II	6,240	7,400	6,150	7,800	6,590	7,160	4,780	5,780
III	5,400	6,500	-	-	4,700	6,140	4,800	5,420
IV	6,000	7,100	6,000	6,600	5,770	7,680	6,450	7,020
V	6,000	7,000	5,990	7,000	5,280	6,300	5,310	6,480
VI	6,000	6,800	7,200	10,000	5,650	6,850	5,890	7,070

TABLE XV - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE V

Region (See Fig. 1)	Consultants		Contractors		Highway Depts.		Munic. & Counties	
	Entr.	Max.	Entr.	Max.	Entr.	Max.	Entr.	Max.
I	\$5,450	\$6,600	\$ -	\$8,380	\$5,400	\$6,630	\$5,170	\$6,180
II	7,540	8,700	7,650	9,050	6,290	7,000	5,710	6,470
III	6,350	7,600	5,000	5,400	5,640	7,030	4,800	5,520
IV	6,800	8,000	6,680	7,800	6,470	9,140	7,360	8,490
V	6,600	7,750	7,250	8,510	5,910	7,300	4,890	5,880
VI	6,300	7,200	9,600	12,000	6,400	7,600	6,650	7,830

TABLE XVI - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE VI

<u>Region (See Fig. 1)</u>	<u>Consultants</u> <u>Entr.</u>	<u>Max.</u>	<u>Contractors</u> <u>Entr.</u>	<u>Max.</u>	<u>Highway Depts.</u> <u>Entr.</u>	<u>Max.</u>	<u>Munic. & Counties</u> <u>Entr.</u>	<u>Max.</u>
I	\$7,200	\$8,400	\$ -	\$8,320	\$6,540	\$8,220	\$5,760	\$6,880
II	7,920	9,360	9,350	11,750	7,300	9,060	5,380	6,180
III	7,110	9,000	5,400	5,400	6,430	7,680	5,800	6,910
IV	7,800	9,150	7,350	8,500	7,440	10,000	7,780	9,290
V	7,200	8,700	7,020	7,800	6,740	8,100	5,360	6,210
VI	7,200	8,700	10,900	15,100	7,500	8,600	6,300	8,860

TABLE XVII - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE VII

<u>Region (See Fig. 1)</u>	<u>Consultants</u> <u>Entr.</u>	<u>Max.</u>	<u>Contractors</u> <u>Entr.</u>	<u>Max.</u>	<u>Highway Depts.</u> <u>Entr.</u>	<u>Max.</u>	<u>Munic. & Counties</u> <u>Entr.</u>	<u>Max.</u>
I	\$7,700	\$10,000	\$ -	\$ -	\$ 6,990	\$ 8,790	\$ 6,030	\$ 6,500
II	9,450	12,000	10,400	13,000	8,860	10,450	6,500	7,000
III	8,400	12,000	6,600	6,600	7,200	8,700	6,300	6,950
IV	8,500	10,850	7,500	10,000	8,230	10,330	7,300	8,900
V	8,700	10,000	7,200	9,350	7,410	8,850	6,420	8,020
VI	8,600	10,200	12,000	16,000	8,800	9,800	8,890	10,800

TABLE XVIII - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE VIII

Region (See Fig. 1)	Consultants		Contractors		Highway Depts.		Munic. & Counties	
	Entr.	Max.	Entr.	Max.	Entr.	Max.	Entr.	Max.
I	\$ 7,700	\$10,000	\$ -	\$ -	\$ 8,560	\$10,840	\$ 6,920	\$ 7,610
II	10,100	12,600	12,000	14,000	9,950	11,730	7,500	9,690
III	10,000	15,000	-	-	7,710	8,550	7,500	8,640
IV	10,000	13,500	9,600	12,000	8,400	11,500	8,780	9,910
V	9,000	10,100	9,100	10,400	8,160	9,600	7,020	7,620
VI	8,200	9,900	14,000	18,000	9,600	11,400	10,350	-

TABLE XIX - COMPARISONS OF MEDIAN RATES BY REGIONS - GRADE IX

Region (See Fig. 1)	Consultants		Contractors		Highway Depts.		Munic. & Counties	
	Entr.	Max.	Entr.	Max.	Entr.	Max.	Entr.	Max.
I	\$15,000	\$ -	\$ -	\$ -	\$ 9,180	\$10,970	\$ 7,900	\$ 9,060
II	11,000	18,000	15,000	20,000	12,110	13,200	9,000	10,000
III	14,400	20,000	18,000	18,000	10,030	10,090	8,150	10,000
IV	15,750	16,600	12,000	18,000	10,890	12,250	10,960	10,760
V	10,000	15,500	8,700	10,000	8,750	12,000	7,980	9,420
VI	10,800	18,000	18,000	22,500	11,400	15,000	11,760	16,800

TABLE XX - COMPARISONS OF MEDIAN RATES BY REGION - EDUCATIONAL INSTITUTIONS

Region (See Fig. 1)	Instructor Entr.	Instructor Max.	Asst. Prof. Entr.	Asst. Prof. Max.	Assoc. Prof. Entr.	Assoc. Prof. Max.	Professor Entr.	Professor Max.	Head of Dept. Entr.	Head of Dept. Max.
I	\$4,420	\$5,780	\$5,120	\$6,840	\$6,670	\$8,160	\$7,500	\$9,740	\$7,320	\$9,720
II	4,800	5,700	5,980	7,200	6,960	8,570	8,140	10,440	10,000	11,200
III	4,400	5,330	4,980	6,200	6,000	7,470	7,040	8,500	7,880	8,870
IV	4,770	6,000	5,930	7,460	6,810	8,270	8,630	10,530	9,910	10,730
V	4,730	5,800	5,600	6,730	6,400	8,000	7,560	8,930	8,000	9,390
VI	4,800	6,000	6,000	7,600	7,580	9,140	8,920	11,900	10,240	13,920

TABLE XXI - AVERAGE UNION WAGE RATES IN THE BUILDING TRADES

As of January 3, 1955 (data from 83 cities) — based on
Table 26 of February 1955 issue of CONSTRUCTION REVIEW,
published under joint auspices of the U. S. Departments of
Labor and of Commerce.

<u>Trade</u>	<u>Estimated Average Hourly Rate</u>	<u>Range in Rate Levels</u>
Bricklayers	\$3.42	\$2.50 - 3.80
Carpenters	2.94	2.18 - 3.50
Electricians	3.13	2.45 - 3.65
Painters	2.81	1.75 - 3.25
Plasterers	3.30	2.25 - 3.75
Plumbers	3.15	2.53 - 3.50
Building Laborers	1.97	0.90 - 2.70

TABLE XXII - EARNINGS OF CONSTRUCTION WORKERS(a)
Contract Construction Year 1954

NOTE: Data in columns (1) to (5), inclusive are based on Table 41 in the March, 1955 issue of CONSTRUCTION REVIEW, published under joint auspices of the U. S. Departments of Labor and Commerce. Columns (6) through (10) are derived by direct computation.

(1)	(2)	(3)	(4)	(5)	(6)		(7)		(8)		(9)		(10)	
					Average	Gross Weekly Earnings Range	Average	Hourly Hours	52 Weeks	50 Weeks	48 Weeks	46 Weeks	44 Weeks	42 Weeks
All construction	\$ 93.75	\$ 87.12(Jan) - \$ 95.74(Oct)	37.0	\$2.53	\$4,875	\$4,688	\$4,500	\$4,312	\$4,125	\$4,069	\$3,934	\$3,811	\$3,710	\$3,522
Building construction:														
All building contractors	94.21	87.46(Jan) - 96.26(Oct)	36.2	2.60	4,898	4,710	4,522	4,334	4,145	4,066	3,986	3,866	3,770	3,582
General contractors	89.30	82.13(Feb) - 91.62(Oct)	36.3	2.47	4,648	4,465	4,286	4,108	3,929	3,849	3,769	3,649	3,552	3,366
All special trades	97.86	91.80(Jan) - 99.90(Aug)	37.9	2.70	5,089	4,893	4,697	4,502	4,306	4,219	4,133	4,046	3,957	3,866
Plumbing and Heating	102.66	99.60(Jan) - 106.92(Dec)	34.4	2.71	5,338	5,133	4,928	4,722	4,517	4,426	4,331	4,235	4,145	3,944
Painting and Decorating	90.10	82.36(Jan) - 92.75(Oct)	38.6	2.62	4,685	4,505	4,325	4,145	3,954	3,874	3,784	3,694	3,604	3,414
Electrical work	112.59	110.08(Sept) - 116.11(Dec)	35.2	2.92	5,855	5,630	5,405	5,180	4,954	4,824	4,694	4,564	4,434	4,244
Other trades	93.07	83.21(Jan) - 96.15(July)	40.0	2.64	4,840	4,654	4,468	4,282	4,096	3,966	3,836	3,706	3,576	3,386
Non-building construction:														
All non-building	92.47	83.88(Jan) - 97.44(Aug)	40.0	2.31	4,809	4,624	4,439	4,254	4,069	3,934	3,811	3,686	3,582	3,394
Highway and street	95.88	71.69(Jan) - 95.26(July)	40.2	2.13	4,986	4,794	4,602	4,411	4,219	4,086	3,954	3,824	3,722	3,534
Other non-building	97.32	91.02(Jan) - 100.77(Aug)	39.8	2.44	5,061	4,866	4,671	4,477	4,282	4,145	4,014	3,884	3,782	3,594

(a) Hours and earnings figures relate to nonsupervisory construction workers, regardless of skills, and working foremen, on either privately or publicly owned projects.

(b) Including base pay, overtime, bonuses, and pay for sick leave, holidays, and vacations taken.

(c) Product of Average Gross Weekly Earnings and number of weeks worked.



PROCEEDINGS PAPERS

The technical papers published in the past year are presented below. Technical-division sponsorship is indicated by an abbreviation at the end of each Paper Number, the symbols referring to: Air Transport (AT), City Planning (CP), Construction (CO), Engineering Mechanics (EM), Highway (HW), Hydraulics (HY), Irrigation and Drainage (IR), Power (PO), Sanitary Engineering (SA), Soil Mechanics and Foundations (SM), Structural (ST), Surveying and Mapping (SU), and Waterways (WW) divisions. For titles and order coupons, refer to the appropriate issue of "Civil Engineering" or write for a cumulative price list.

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c. Discussion of several papers, grouped by Divisions.

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